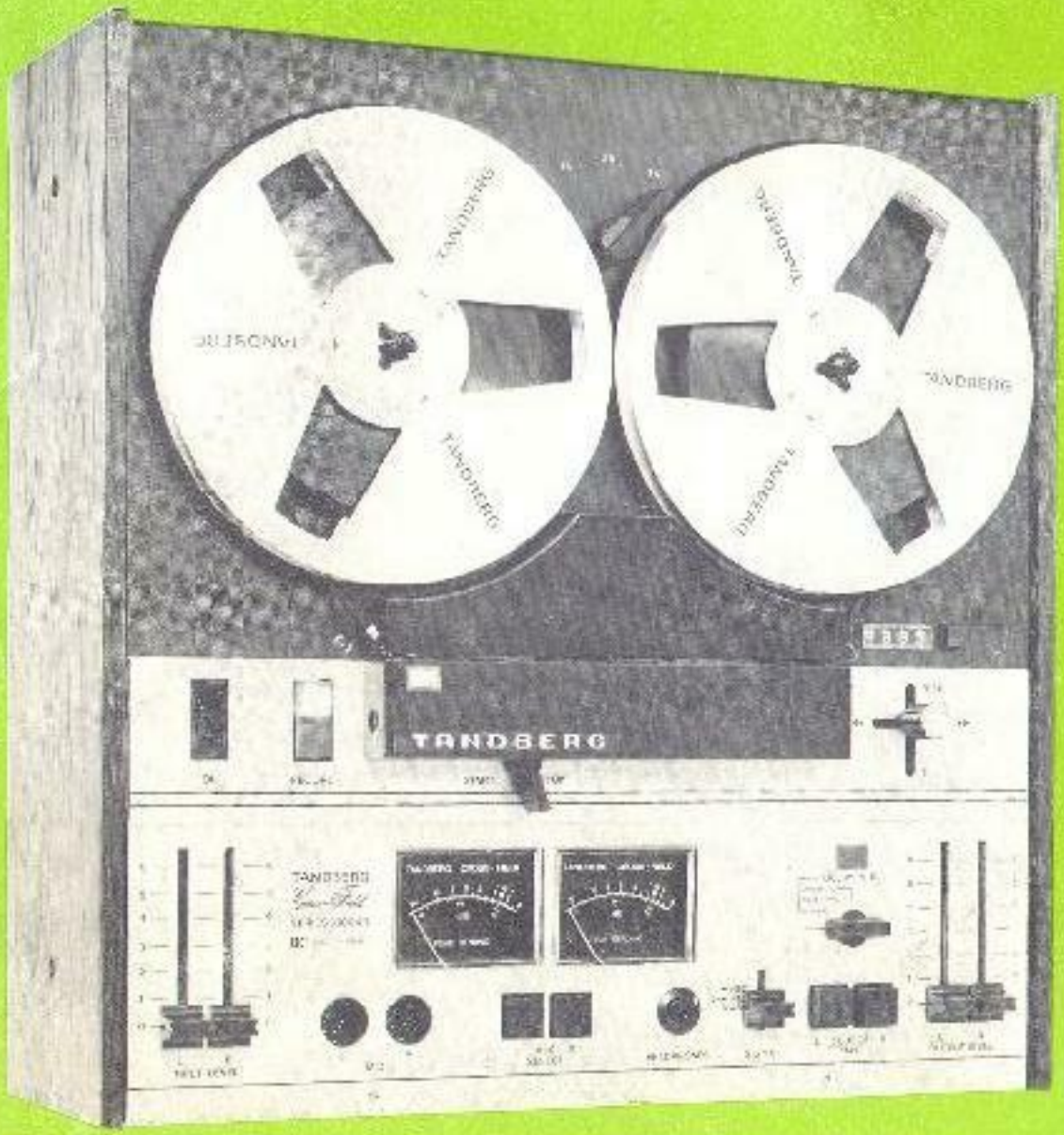
ENGLISH



Operating instructions

Contents:

What are the controls for? . . . . . p. 2
Power requirements . . . . . p. 3
The Dolby N.R. knob . . . . . p. 3
Tape . . . . . p. 4
Vertical mounting . . . . . p. 4
Connections . . . . . p. 4
Slide projector . . . . . p. 5
Automatic stop . . . . . p. 5
Preparation for use . . . . . p. 6
Recording . . . . . p. 6
Monitoring during recording . . . . . p. 8
Playback . . . . . p. 8
Tracks and channels . . . . . p. 8
How to make a good recording . . . . . p. 9
Sound-on-Sound . . . . . p. 10
Echo . . . . . p. 11
Language learning . . . . . p. 12
The tape deck used as an amplifier . . . . . p. 12
Mixing . . . . . p. 13
How to locate a program on the tape . . . . . p. 13
Editing and splicing of tape . . . . . p. 14
Maintenance . . . . . p. 14
The Dolby system explained . . . . . p. 15
Operator's trouble shooting guide . . . . . p. 15
Function table . . . . . p. 16
Useful data . . . . . p. 16

Tandberg tape recorder 3600XD

What are the controls for?

SPEED. For selection of tape speed during recording and playback.

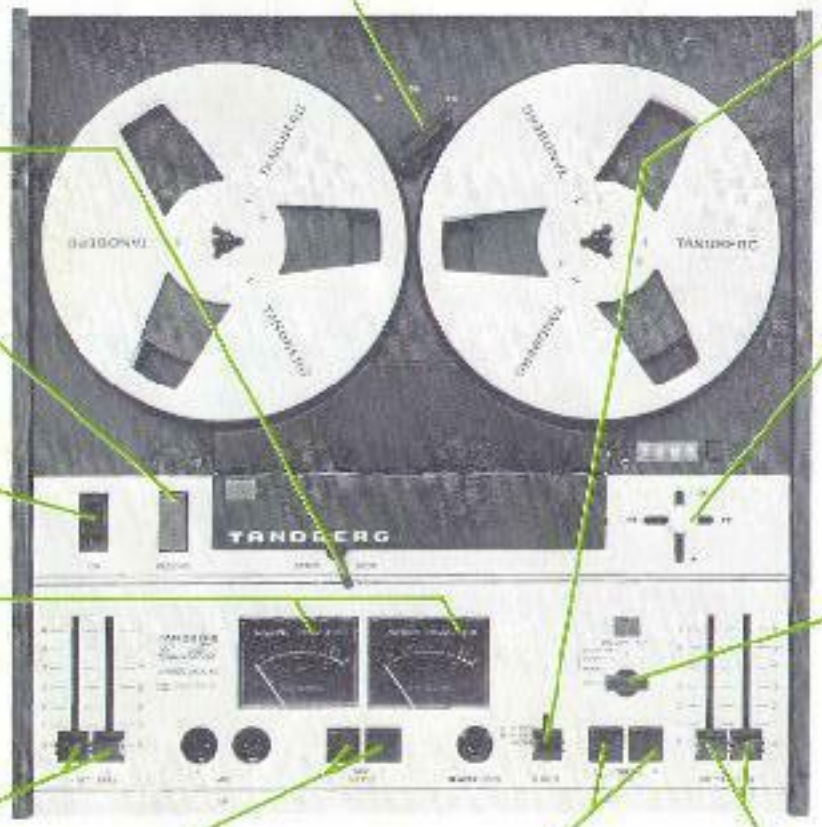
START/STOP lever.
Can be used to stop the tape during recording and playback.

RECORD button. To start recording, depress this button while moving the tape motion lever to ▶.

POWER on/off switch.

Program level meters. Indicate program level during recording and playback.

INPUT LEVEL, Left and Right channels. When recording, adjust each knob so that the pointer of the corresponding **program level meter** deflects up to the red sector (0 dB).



S ON S. The knob must be in the OFF position for normal recording. In other positions of the knob, the program played off one track can at the same time be re-recorded on the same track (Echo) or on the other track (Sound-on-Sound).

Tape Motion lever.

▶ : Drive speed for recording and playback.

▶▶ : Forward winding.

◀◀ : Reverse winding.

FREE: For threading of tape.

Centre position: Stop. The lever should always be in this position when the recorder is not used.

DOLBY Noise Reduction knob.
OFF: Recording or playback without Dolby (the lamp extinguished).

NORM: Recording with DOLBY N.R. a program from any program source (except stereo FM programs and Dolbyized FM programs). Playback of tapes recorded with DOLBY N.R.

FILTER: Only for recording a stereo radio program. A filter removes the pilot tone. Otherwise as NORM.

DOLBY FM: Only for recording a Dolbyized radio program.

REC SELECT, Left and Right channels.
Stereo recording: Depress both buttons.
Mono recording: Depress only the button for the channel to be used.

SOURCE/TAPE, Left and Right channels.
Stereo playback: Depress both buttons.
Mono playback: Depress only the button for the channel to be played back.

Use the SOURCE/TAPE buttons also to check the quality of the recorded sound (see "Monitoring", page 8).

OUTPUT LEVEL, Left and Right channels. In most cases position 5 or 6 will give a suitable playback level (see "Playback", page 8).

Power requirements

Standard model:	230 V/50 Hz
English model:	240 V/50 Hz
US model:	115 V/60 Hz

Make sure that your tape deck is wired for the voltage in your area.

Changing from one line voltage and/or line frequency to another should be carried out by a competent service technician.

The power consumption of the tape deck is approximately 50 watts.

The word "Dolby" is a trademark of Dolby Laboratories Inc.

The DOLBY N.R. knob

3600XD is equipped with the Dolby Noise Reduction System which reduces tape hiss without affecting the quality of the recorded program.

During a recording with Dolby the program is encoded in a certain way to reduce the effect of the tape noise. A program encoded in this manner is called a *Dolbyized program*. During playback the program is similarly decoded.

You can make Dolbyized recordings on your 3600 XD. You can also record programs that have been Dolbyized beforehand (some radio stations broadcast Dolbyized FM programs).

You should always switch on the Dolby System when making a recording. The System is switched on by means of the knob marked DOLBY N.R., and the tables in the next column show you how to set this knob during recording and playback.

RECORDING

Type of recording	Set the DOLBY N.R. knob to
Recording a grammophone record Microphone recording Recording an ordinary radio program Copying a non-Dolby tape	NORM
Recording a stereo FM program	FILTER
Recording a Dolbyized FM program	DOLBY FM
Copying a Dolbyized tape	NORM (The Dolby System of recorder A must also be activated).

PLAYBACK

Type of playback	Set the DOLBY N.R. knob to
Playback of any of the above-mentioned recordings	NORM

Important! All the recordings in the table above will be **Dolbyized.** If you wish to make a non-Dolby recording, the DOLBY N.R. knob should be set to OFF. This can be done for example if the tape is to be played back on *another tape deck without Dolby facilities.*

The DOLBY N.R. knob should also be set to OFF during *playback* of non-Dolby recordings (for example recordings made on another tape deck).

Tape

The tape deck is adjusted for recording on Tandberg High Output Low Noise (HL) tape or its equivalent. For a given distortion this tape gives 3 to 4 dB higher output level than ordinary low noise tape.

If ordinary low noise tape is used for recording, the deflection of the program level meters should not exceed -2.5 dB if excessive distortion is to be avoided.

Always cut away the adhesive part of the leader tape to prevent the adhesive substance from contaminating the tape heads.

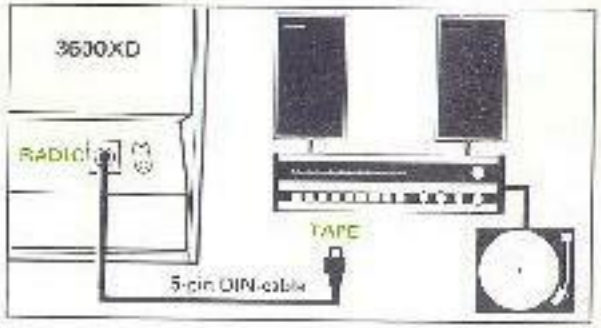
Vertical mounting

The tape deck can be used in a horizontal or vertical position or any intermediate angle. The front is equipped with rubber feet for vertical mounting.

To prevent the tape reels from falling off during vertical operation, rotate the reel locks 1/4 turn to lock the reels into place.

Connections

Radio or amplifier.

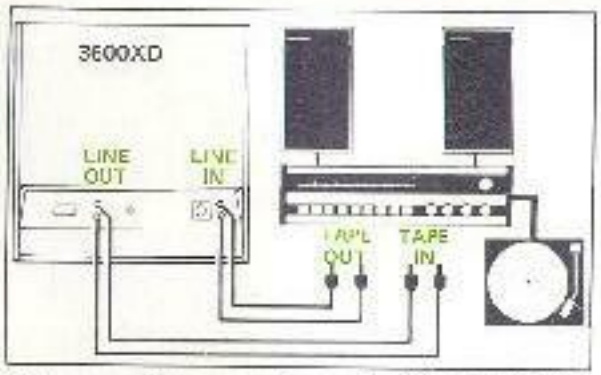


The tape deck does not have built-in power amplifiers and must therefore be used in conjunction with a stereo radio or stereo amplifier.

Connect a 5-pin DIN-cable from the RADIO socket at the rear of the deck (opposite the tape reels) to the TAPE socket on the radio or amplifier.

This connection makes possible *playback* of tapes over the loudspeakers of the radio/amplifier. The connection also renders possible *recording* of radio programs or music from a record player or other program sources connected to the radio/amplifier.

Alternatively, the radio/amplifier can be connected with four phono cables. Connect two cables from sockets LINE OUT L and R on the deck to corresponding sockets marked TAPE IN on the radio/amplifier *(playback)*. Also connect two cables from sockets LINE IN L and R on the deck to



corresponding sockets marked TAPE OUT on the radio/amplifier *(recording)*.

Microphones.

For mono or stereo recording of live programs, connect one or two microphones respectively to sockets MIC L and R on the top panel.

Use microphones with impedance of 200-700 ohms.

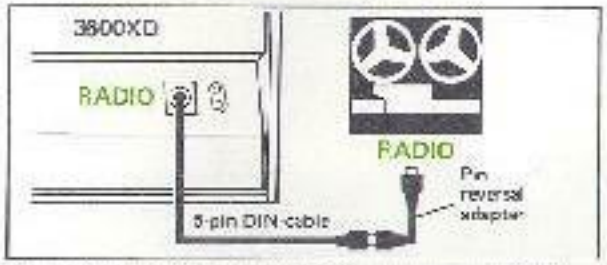
The sensivity of the MIC input automatically adjusts itself for the impedance of the microphone.

Slide projector

Headphones.

Connect stereo headphones to the socket HEADPHONES on the top panel. The headphone impedance should be minimum 100 ohms.

Cassette deck or second tape deck.



To copy stereo or mono tapes use a 5-pin DIN-cable with a pin reversal adapter connected from the radio socket on the 3600XD to the RADIO socket on the other tape machine.

Alternatively, phono cables can be used. Connect two cables from sockets LINE OUT on the machine used for playback to sockets LINE IN on the machine used for recording.

Commentaries to your slides can be recorded on 3600XD and later played back in synchronism with projection of the slides.

To do this you will need a Tandberg Tape Slide Synchronizer. When you prepare a slide program and record your commentaries on one track, the synchronizer is used to generate pulses that are recorded on the other track each time you change a slide.

When playing back the commentaries from one track of your 3600XD, the shift pulses from the other track, via the synchronizer, will control the slide projector so that sound and picture coincide.

Further instructions appear in the operating manual for the synchronizer.

Automatic stop

A photoelectric end-stop sensor (located under the head covers on the left side) will stop the machine when the tape runs out or if the tape snaps.

If the tape reel has a transparent section of tape , the machine will also stop when this section is reached.

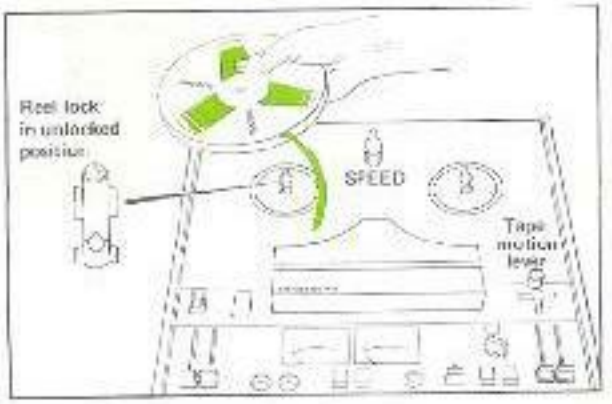
To move the tape past the transparent section, set the tape motion lever in FREE position and rotate the reels by hand.

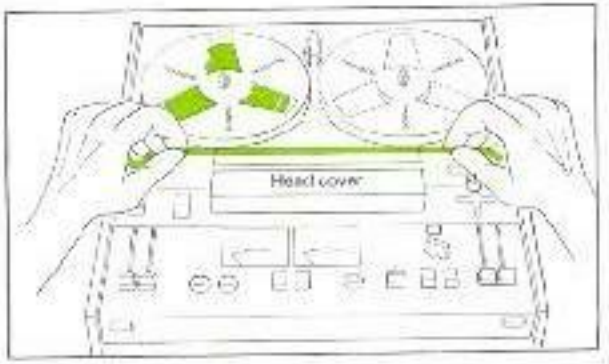
Should the lamp for the end stop sensor burn out, the recorder will still operate normally, except that it must be stopped manually at the end of the tape.

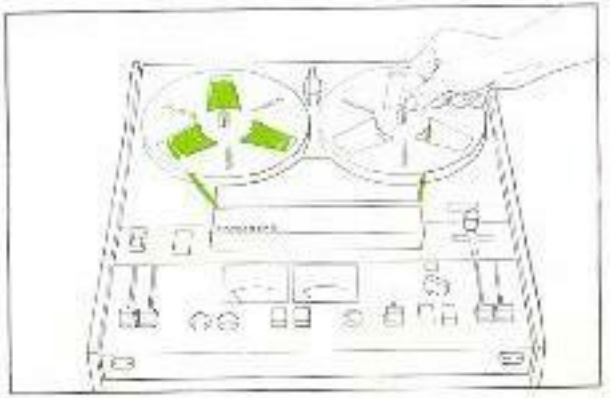
The photoelectric end-stop sensor will prevent the tape deck from starting until a tape has been properly inserted (see page 6). Wrong threading of the tape may prevent starting.

Preparation for use

1. Connect the power cable to a power socket.
2. Switch on the tape deck by operating the ON switch on the left.
3. Set the SPEED knob for the desired tape speed. The best sound quality is obtained at 7 1/2 ips. 3 3/4 ips also gives an excellent result, and the playing time is twice as long. At 1 7/8 ips the playing time is four times as long.
4. Ensure that both reel locks are in the unlocked position (see top fig.). Put a full tape reel on the left-hand turntable and an empty reel of the same size on the right-hand turntable. Then rotate both reel locks 1/4 turn to lock the reels into place.
5. Set the tape motion lever in position FREE.
6. Insert the tape into the slot between the two head covers (see middle fig.). Then place the tape end against the hub of the empty reel (see bottom fig.). Take up the slack by rotating the empty reel a few turns anticlockwise.







Recording

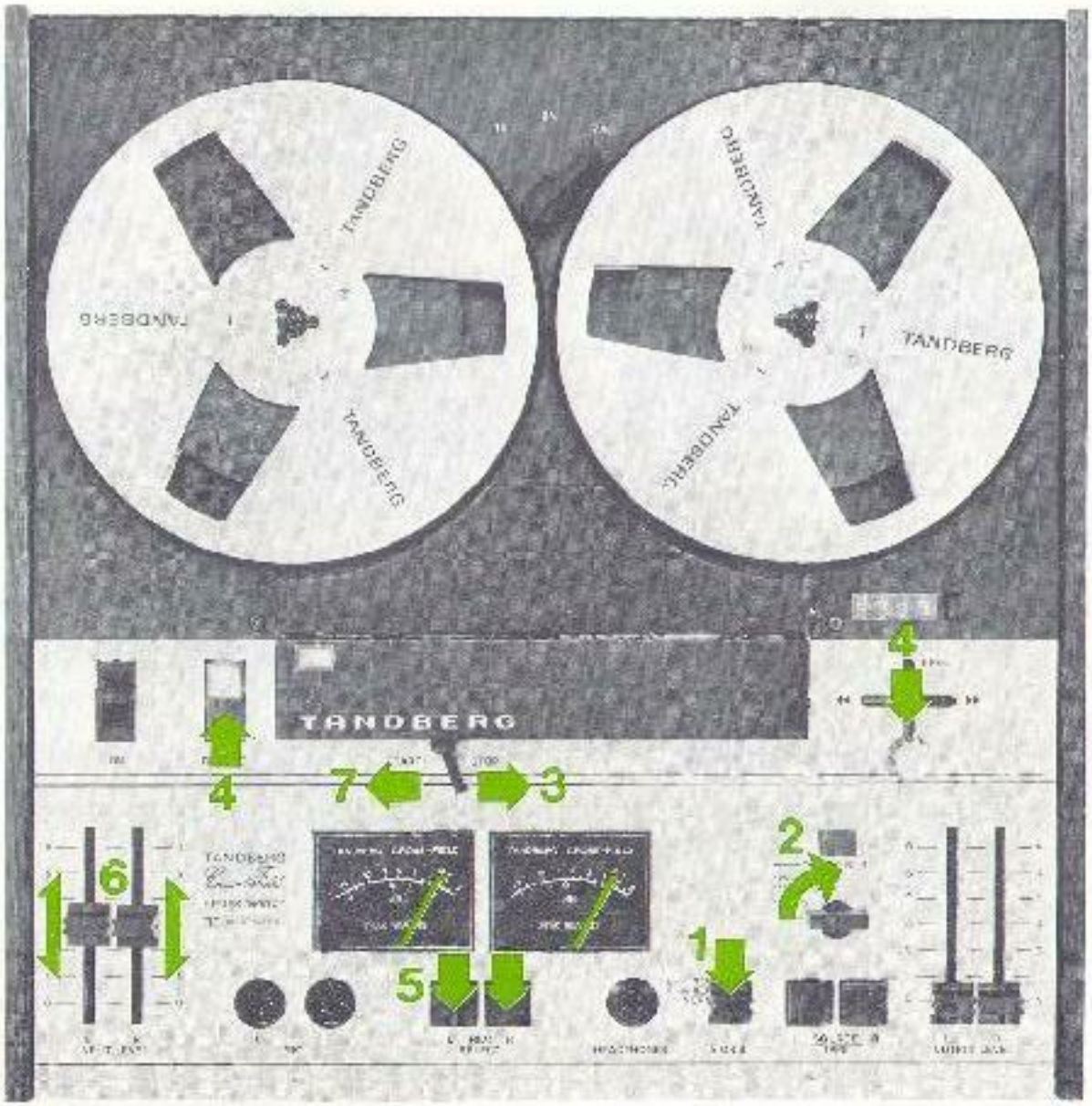
Stereo.

1. Ensure that the S ON S knob is in the OFF position.
2. Set the DOLBY N.R. knob to correct position (see table on page 3).
3. Set the START/STOP lever to STOP.
4. Depress the red RECORD button while moving the tape motion lever to ▶
5. Depress both the black REC SELECT buttons. Both program level meters and the RECORD button light up.
6. Adjust the input level in the following manner:

■ *When recording from microphones:* Speak or sing into the microphones and at the same time adjust the INPUT LEVEL knobs so that the meter pointers deflect up to the red sectors (see figure next page).

■ *When recording from a program source connected to LINE IN or RADIO:* Start the program source and feed a sample of the program to the tape deck. Adjust the INPUT LEVEL knobs so that the meter pointers deflect up to the red sectors (see figure next page).

■ *When recording a Dolbyized radio program:* A calibration tone is broad-



cast before the program starts. During this tone, adjust INPUT LEVEL so that the pointers deflect to the "50%" mark on the meters. This gives the correct input level for the program.

The setting of the two INPUT LEVEL knobs will not necessarily be the same. This is normal because the meters are more accurate than the scale of the knobs.

7. Start the recording by moving the START/STOP lever to START.

   For shorter stops move the START/STOP lever to STOP.

   When the recording has been completed, do also set the tape motion lever to its centre position.

Mono.

The procedure for mono recordings is the same as for stereo except that step 5 changes to:

5. Depress the REC SELECT button for the channel to be used for recording.

When only the REC SELECT button for one channel is depressed, the programs from all inputs are connected to that channel. If one microphone is used, it can therefore be connected to either left or right microphone socket.

Monitoring during recording

The sound quality of the recording can be checked by operating the SOURCE/TAPE buttons.

Buttons out: You will hear the program *before* it is recorded on tape. This is called *source monitoring*.
Buttons depressed: You will hear the program a fraction of a second *after* it has been recorded on tape. This is called *tape monitoring*.

If the recording has been made correctly, the sound quality before and after recording should not differ audibly.

It is best to use headphones for monitoring. In this case, the volume of the connected amplifier should be turned down. If, however, the amplifier has a TAPE MONITOR button, the program can also be monitored in the loudspeakers. Tape monitoring is then achieved by depressing the TAPE MONITOR button and both SOURCE/TAPE buttons.

During tape monitoring, the volume of the program is adjusted with the OUTPUT LEVEL knobs. Set these knobs so that the volume is exactly the same during source and tape monitoring.

When monitoring a mono recording, operate only the SOURCE/TAPE button for the channel in use, and set the OUTPUT LEVEL knob for the other channel to zero.

Playback

Stereo.

1. Set the DOLBY N.R. knob to the position indicated in the table on page 3.
2. Depress both the black SOURCE/TAPE buttons.
3. Set the START/STOP lever to stop.
4. Set the tape motion lever to ▶ .
5. To start the playback, move the START/STOP lever to START.
6. With both OUTPUT LEVEL knobs adjust the volume of the playback program to the same level as programs from other sources used with the connected amplifier (e.g. a record player). The volume control on the amplifier can be used for further adjustment. Do not forget to depress the TAPE button on the amplifier.

Mono.

The procedure for mono playback is the same as for stereo except that steps 2 and 6 change to:

2. Depress the SOURCE/TAPE button for the channel to be played back.
6. With the OUTPUT LEVEL knob for the channel in use, adjust the volume of the playback program to the same level as programs from other program sources used with the connected amplifier (e.g. a tape recorder). Set the OUTPUT LEVEL knob for the other channel to zero.

Tracks and channels

What is a channel? What is a track?

A *channel* is the path that the program follows through the tape deck and amplifier during recording and playback. A mono recording requires only one channel, whereas a stereo recording requires two: left and right channels.

A *track* is the strip of tape that is magnetized during recording, and which is used to "store" the recorded sound. There are two types of stereo reel-to-reel tape decks: the 4-track type and the 2-track type.

4-track tape decks.

The location of the four tracks across the width of the tape is such that when starting from one end of the tape, track 1 will be recorded when REC SELECT L is depressed and track 3 will be recorded when REC SELECT R is depressed.

When starting from the opposite end of the tape, recording will take place on

track 4 when REC SELECT L is depressed and on track 2 when REC SELECT R is depressed.

This means that you can make one stereo recording or two mono recordings from each end of the tape.

2-track tape decks.

A stereo recording made from one end of the tape occupies the full width of the tape so that recordings cannot be made from the other end. This means that if you have a 2-track tape deck, you can make only one stereo or two mono recordings on each tape. Notice that when a mono recording has been made from one end of the tape and the tape has been turned over and returned to the left-hand turntable ready for recording from the other end of the tape, the REC SELECT buttons should *remain unchanged*.

It is the properties of the tape deck and not the tape that determines whether the system is 4-track or 2-track. The same kind of tape can be used on 4-track and 2-track tape decks.

The following six tips will help you obtain the best possible performance from your tape deck.

1. Choose the right tape.

Always use tapes of high quality from well-known manufacturers. Make sure that you choose the kind of tape for which your tape deck has been adjusted. See paragraph on "Tape", page 4.

2. Choose the correct speed.

7 1/2 ips gives the best sound quality. However, the Tandberg Cross-Field recording technique ensures excellent results even at 3 3/4 ips. The lowest tape speed - 1 7/8 ips - is suitable for recording of speech and background music.

3. Adjust the input level correctly.

Correct adjustment of the INPUT LEVEL knobs is extremely important. Therefore you should always watch the meters closely when recording. If the pointers deflect into the red sectors for long periods the tape will be oversaturated and the recorded program will be distorted.

If, on the other hand, the pointers do not deflect up to the red sectors (0 dB) for the strongest signals, the recorded program will be to weak and the tape noise may become noticeable during playback.

Some tapes require a higher input level than others. When starting to use a new brand of tape, you should therefore make a few recordings at different INPUT LEVEL settings to find out how far into the red sectors the pointers can deflect before any audible distortion occurs.

If you sample the loudest passages of the music when adjusting the INPUT LEVEL knobs, you will not have to readjust later.

4. Monitor the program during recording.

Read the paragraph on monitoring (page 8) again. Monotoring provides an excellent control of the recording quality. Always use it when recording.

5. Clean the tape path regularly.

Dust as well as oxide particles and plastic binder particles from the tape will eventually be deposited on the parts of the tape deck that are in contact with the tape. This will result in reduced sound quality unless the parts are cleaned regularly. See "Maintenance", page 14.

6. "Polish" new tapes to avoid drop-outs.

Before starting to record on a new, blank tape set the recorder to PLAY and run through the whole length of the tape once in each direction. The small irregularities in the tape surface will then be reduced and there will be less chance of drop-outs.

Sound-on-Sound

The Sound-on-Sound recording technique allows a program played back from one track to be mixed with another program and re-recorded on another track on the same tape. With this technique you can add your own voice to a recording of an orchestra, you can sing in many voices by adding one voice after another, or you can play many instruments, forming a band with yourself as the only musician.

Assuming that the first program will be recorded on the top track (left channel), Sound-on-Sound recording can be carried out as follows (voices are used in this example):

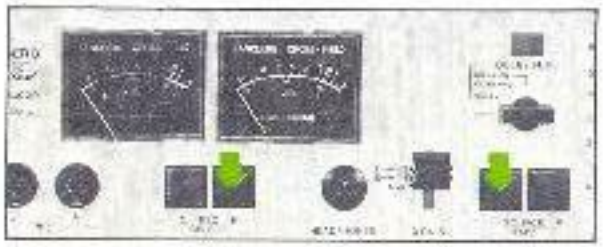
1. Connect microphone to MIC L and headphones to the socket HEAD-PHONES.
2. Set the DOLBY switch to NORM.
3. Reset the tape counter.
4. Set the START/STOP lever to STOP.

Recording the first voice.

The first recording of the Sound-on-Sound operation is an ordinary mono recording.

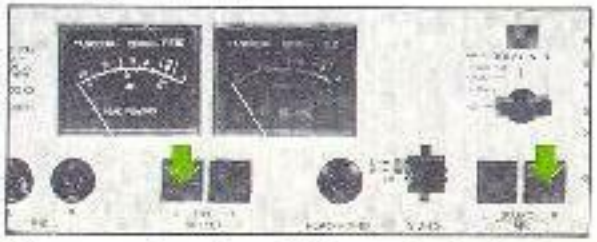
1. Set the S ON S knob to OFF.
2. Depress REC SELECT L.
3. Depress the red RECORD button while moving the tape motion lever to ▶.
4. Sing into the microphone and adjust INPUT LEVEL L for 0 dB deflection on the left-hand meter.
5. Start the recording by moving the START/STOP lever to START.

Adding a second voice.



1. Rewind to zero on the counter.
2. *Unplug any cables connected to the sockets LINE IN and RADIO at the rear of the tape deck.*
3. Set the S ON S knob to L→REC. Release REC SELECT L and depress REC SELECT R. Depress SOURCE/TAPE L. (SOURCE/TAPE R should be out). Set OUTPUT LEVEL L to zero, and OUTPUT LEVEL R to give normal listening level.
4. Set the START/STOP lever to stop.
5. Press the RECORD button while moving the tape motion lever to ▶.
6. Sing into the microphone and adjust to slightly less than 0 dB deflection with INPUT LEVEL L. At the same time set INPUT LEVEL R between 3 and 4.
7. Move the START/STOP lever to START. The first voice is played back from the tape and you will hear it in one of your headphones. Sing into the microphone to add the second voice which will be heard in the same headphone together with the first voice. Adjust the level of the first voice with INPUT LEVEL R, the level of the second voice with INPUT LEVEL L. The meter deflection for both voices combined should be 0 dB.

Adding a third voice.



The procedure for adding a third voice is the same as for adding a second voice, except that step 3 changes to:

Echo

Do not forget to set the S on S knob back to OFF when the echo recording has been completed.

3. Set the S ON S knob to R→REC.
   Release REC SELECT R and depress REC SELECT L.
   Release SOURCE/TAPE L and depress SOURCE/TAPE R.
   Set OUTPUT LEVEL R to zero and OUTPUT LEVEL L to give normal listening level.

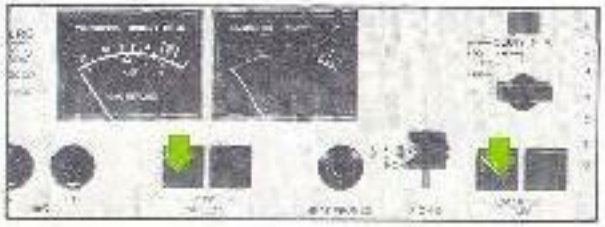
The level of the voices played back from the tape (first and second voice) is adjusted with INPUT LEVEL R.

A **fourth voice** is added in the same way as the second voice, a **fifth voice** is added in the same way as the third voice.

Normally, a few test recordings are necessary to achieve the desired balance.

A mono recording with echo can be made on either the left or the right channel. The echo time is dependent on the tape speed - 7 1/2 ips gives the most "natural" echo whereas a "special effect" echo is achieved at 3 3/4 and 1 7/8 ips.

Recording with echo on the left channel.



1. Connect microphone to MIC L and headphones to the socket HEADPHONES.
2. Set OUTPUT LEVEL L to give normal listening level for headphones, and set OUTPUT LEVEL R to zero.
3. Set the S ON S knob to L→REC and depress REC SELECT L. (REC SELECT SELECT R should be out).
   Depress SOURCE/TAPE L. (SOURCE/TAPE R should be out).
4. Set the START/STOP lever to STOP.
5. Depress the red RECORD button while moving the tape motion lever to ▶.
6. Sing into the microphone and adjust to slightly less than 0 dB deflection with INPUT LEVEL L.
7. Start the recording by moving the START/STOP lever to START. Listen in the headphones and adjust the echo level with INPUT LEVEL R. If necessary, readjust INPUT LEVEL L to achieve 0 dB deflection on the meter.

Note: If INPUT LEVEL R is turned up too much, the echo "takes over" completely and spoils the recording.

Recording with echo on the right channel.

The procedure is the same as for recording on the left channel except that step 2 and 3 change to:

2. Set OUTPUT LEVEL R to give normal listening level for headphones and set OUTPUT LEVEL L to zero.
3. Set the S ON S knob to R→REC and depress REC SELECT R. (REC SELECT L should be out).
   Depress SOURCE/TAPE R. (SOURCE/TAPE L should be out).

An echo recording can also be made from other program sources. The program source is then connected to LINE IN L. and the recording level is adjusted with INPUT LEVEL L., no matter which channel the echo is recorded on. The echo level is adjusted with INPUT LEVEL R.

Language learning

For language learning a master program[1]) recorded on one track is played back and listened to by the student, who can simultaneously record his own excercises on another track. The following procedure assumes that the master program is pre-recorded on the left channel.

Recording your own excercises

1. Connect microphone to the MIC R socket.
2. Set the S ON S knob to OFF.
3. Depress SOURCE/TAPE L (SOURCE/TAPE R must be out).
4. Set the START/STOP lever to STOP.
5. Depress REC SELECT R.
6. Depress the red RECORD button while moving the tape motion lever to to ▶.
7. Speak into the microphone and adjust to 0 dB deflection on the right-hand meter with INPUT LEVEL R. Adjust OUTPUT LEVEL R so that you can hear your own voice in one headphone.
8. Start the tape by moving the START/STOP lever to START. You will hear the master program in one headphone and your own voice in the other. Listen to the program and repeat the exercises in the pauses.
   Adjust OUTPUT LEVEL L to hear the master program at the same level as your own voice.

Playback and comparison

1. Rewind to the beginning of the program.
2. Depress SOURCE/TAPE R. (SOURCE/TAPE L still depressed).
3. Start the tape in playback by moving the tape motion lever to ▶ and the START/STOP lever to START.
4. Listen and compare your own responses with the master program. If you are not satisfied with the result, release SOURCE/TAPE R, rewind and record your own voice once more as described above.

1) A master program is a recording with "native" voices of phrases and sentences to be practised by the student. Between each sentence there is a suitable gap (about 1 1/2 times as long as it takes to say the sentence) to give the student time to repeat. Pre-recorded master programs are available, but you can also record the program yourself from a school broadcast or gramophone record.

The tape deck used as an amplifier

The tape deck can be used as a microphone amplifier. It is also possible to play back a mono tape program and at the same time use the tape deck as a microphone amplifier. This makes the tape deck suitable for department stores, auditoriums, small discoteques and other places where it is desireable to distribute music interrupted by commentaries via a microphone.

Microphone program

1. Connect microphone(s) to the MIC socket(s) and set the REC SELECT and SOURCE/TAPE buttons as indicated in the table below.

	REC SELECT	SOURCE/TAPE
Mono	Depress button for desired channel	Both buttons out
Stereo	Depress both buttons	Both buttons out

2. Set OUTPUT LEVEL L and R to maximum.
3. Depress the TAPE button on the radio or amplifier which the tape deck is connected to. Singing or speech picked up by the microphone(s) will be reproduced over the loudspeakers of the radio/amplifier. Adjust the volume with the INPUT LEVEL knob(s) on the tape deck and the VOLUME control on the radio/amplifier.

Do not place the microphones too near the speakers as this may lead to acoustic feedback (howling).

Mixing

Combined playback/amplifier function.

A program can be played back in mono while the tape deck is simultaneously used as a microphone amplifier.

1. Set the S ON S switch to L→REC when playing back from the left channel and to R→REC when playing back from the right channel.
2. Connect a microphone to MIC L and depress either one of the REC SELECT buttons.
3. Set OUTPUT LEVEL L and R to maximum.
   Depress the SOURCE/TAPE button for the channel to be played back.
4. Depress the TAPE button on the radio or amplifier connected to the tape deck.
5. Start the tape recorder in playback. Both the program played back and the microphone program can now be reproduced in the speakers of the channel for which the SOURCE/TAPE button is released. The volume of the program played back is adjusted with INPUT LEVEL R. The volume of the microphone program is adjusted with INPUT LEVEL L.

The RECORD button must **not** be depressed.

Mono.

In mono (when only one of the REC SELECT buttons is depressed) it is possible to mix two programs with full control over the mixing ratio by means of the INPUT LEVEL controls.

The four possible combinations of programs that can be mixed are programs applied to input sockets:

1. MIC L and MIC R
2. MIC L and LINE R
3. LINE L and MIC R
4. LINE L and LINE R

For all other combinations of programs, the mixing ratio is determined by the individual levels of the programs as they arrive from their respective sources.

Stereo.

In stereo (when both REC SELECT buttons are depressed) programs from the left (L) inputs can be mixed into the left channel and programs from the right (R) inputs into the right channel. The relative levels of the individual programs cannot be determined by the controls on the tape deck. Hence the mixing ratio will equal the ratio of the programs as they are applied to the tape deck.

How to locate a program on the tape

Tape counter.

When recording set the counter to zero at the beginning of the tape and write down the counter reading at the beginning of each piece of music. This will make it easy to locate the various pieces of music later on.

Finding the exact cutting point for editing.

For editing purposes it may be necessary to locate a point on the tape more accurately – for example the end of a program.

Play back the tape and at the end of the program move the START/STOP lever to STOP. Turn the tape reels by hand and listen in headphones or loudspeakers to determine exactly when the end of the program is at the playback head.

If you want to cut and splice the tape, see page 14.

If you want to start a new recording immediately after the program, turn the tape reels so that the tape moves 3/4" to the left. If a new recording is started from this point, there will be no gap between the previous and the new recordings.

Editing and splicing of tape

Cutting and splicing for editing purposes must not be performed if there is a second program of value on another track.

Programs are not always recorded in the same sequence as they are required for playback. It may therefore be necessary to edit tapes, i.e. cut and splice to present the programs in the desired sequence.

1. Locate the cutting point as described in the paragraph "Finding the exact cutting point for editing", page 13.

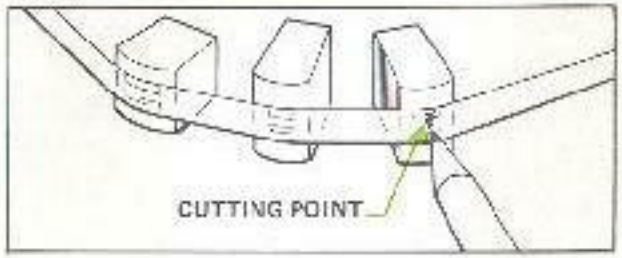
2. When the cutting point has been located, remove the front head cover (the one with "Tandberg" printed on it) by pushing the buttons on each end and lifting it straight up.

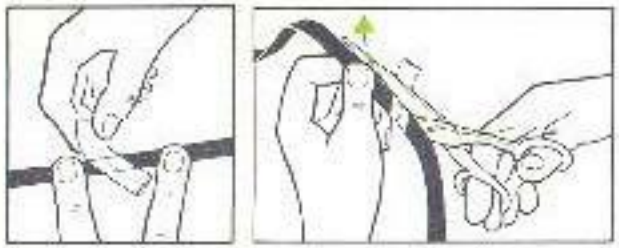
3. Use a soft pen (felt or fibre) to mark the tape at the playback head (see top figure). This mark indicates where the tape should be cut and spliced.

4. Lay one tape over the other with the same side of the tapes facing upwards. Cut the tape with scissors or knife (non-magnetic!) at an angle of about 45 degrees. Do not touch the tape surface with your fingers more than necessary.

5. Lay the tape ends against each other with no gap or overlap and with the shiny side up. Lay the splicing tape across the join parallel to the cut, and press firmly, squeezing out any air bubbles.

6. Cut the splicing tape along both edges. The cut should curve slightly into the edge of the recording tape to prevent adhesive on the splicing tape from being deposited on the magnetic heads.





Adhesive tape that is not expressly intended for splicing of recording tapes must under no circumstances be used, as such tape may damage the tape deck. Special splicing tape is available from audio shops.

Splicing will also be necessary if the tape has snapped or if leader tape is required.

Maintenance

Cleaning.

The parts of the tape deck that are in contact with the tape surface should be cleaned regularly, otherwise the sound quality will be greatly reduced.

When to clean. If the tape deck is used every day, cleaning should be performed at least once a month. A good time to clean is just before making an important recording.

What to use. The cleaning can be done with cotton wool or a piece of flannel wrapped around a small stick and moistened with pure alcohol or methylated spirit. A kit intended for this purpose, "Tandberg Professional Tape Head Cleaner" is available.

Do not use solvents, such as acetone or trichlorethylene, as they may damage the heads.

How to clean. Remove the two head

covers by pushing the buttons on the side of the covers. Clean the spots indicated in color on the figure.

Pay particular attention to the sharp corners of the tape guide posts where deposits tend to settle (tape edge).

The pinch roller (A) needs to be cleaned only if the tape motion is uneven or if there are visible deposits on the roller. (four to six times a year will be satisfactory for even a frequently used machine). Dry the roller after cleaning.

DO NOT USE ANY SHARP OBJECTS WHEN CLEANING. DO NOT TOUCH THE ADJUSTMENT SCREWS.

Degaussing.

A marked increase in background noise from the tape may indicate that the heads or other parts in the tape path should have the residual magnetism removed (degaussing).

If required, degaussing should be carried out as follows. Switch off the recorder. Remove the two head covers and move the degausser slowly past each one of the metal parts normally in contact with the tape. Take great care not to let the degausser touch the heads or metal parts in the tape path. Do not switch off the degausser until it is at least 3 ft from the recorder.

The Dolby System takes advantage of the fact that the tape noise is most annoying during soft passages in the recorded music, whereas during loud passages it will not be heard. During recording, the system increases the volume of the softer tones in the middle and upper part of the audible tonal range. The increase is *dependent on the signal strength* - the softer the tones, the greater the increase.

During playback, the tones are reduced by the same amount as they were increased beforehand. The softest tones will get the greatest reduction, and the noise lying "under" these tones will be correspondingly reduced. All tones are thus restored to their original levels, and the noise is considerable reduced during soft passages in the music.

Two important points.

- The Dolby System reduces the tape noise without cutting down the high tones of the recorded program.
- If the Dolby System is used during recording, it must also be used during playback in order to achieve a correct reproduction.

Problems	Possible cause:
No light in the tape deck when switching on.	Power cable is not connected to power socket. Loose wire in power plug.
Tape does not start in any position of the tape motion lever.	Tape not properly inserted (see page 6).
Tape starts but stops again immediately.	Transparent leader tape in front of photoelectric end-stop sensor (see page 7).
No sound in loudspeakers during playback.	TAPE button on connected radio/amplifier not depressed.
0 dB deflection on meters during recording requires different settings of left and right INPUT LEVEL knobs.	This is normal (see page 7). Also check that S ON S knob is in position OFF.
Echo on recording.	S ON S knob not in position OFF.
Not enough treble during playback, "muffled" sound.	DOLBY knob not in position OFF during playback of non-Dolby tapes.
Too much treble during playback, "screechy" sound.	DOLBY knob in position OFF during playback of Dolbyized tapes.
Irregular tape motion, wow, flutter, drop-outs.	Cleaning required (see page 14).
Meter deflection during playback is smaller than during recording.	This is normal. The reason is that the higher tones are pre-emphasized during recording.

Function table

OPERATION	POSITIONS OF BUTTONS AND KNOBS				SEE PAGE
	REC SELECT L R	SOURCE/TAPE L R	FUNCTION SELECTOR	S ON S SWITCH	
Mono recording on channel L with program monitoring (source tape test)		SOURCE TAPE	RECORD	OFF	7 and 8.
Mono recording on channel R with program monitoring (source tape test)		SOURCE TAPE	RECORD	OFF	7 and 8.
Stereo recording with program monitoring (source tape test)		SOURCE TAPE	RECORD	OFF	6 and 8.
Mono playback from channel L.			PLAY	OFF	8.
Mono playback from channel R.			PLAY	OFF	8.
Stereo playback.			PLAY	OFF	8.
Sound-on-sound recording on channel L.			RECORD	R→REC	10.
Sound-on-sound recording on channel R.			RECORD	L→REC	10.
Echo recording on channel L.			RECORD	L→REC	11.
Echo recording on channel R.			RECORD	R→REC	11.
Mono preamplifier - channel L.				OFF	12.
Mono preamplifier - channel R.				OFF	12.
Stereo preamplifier.				OFF	12.
Playback from channel L while using channel R as microphone amplifier.	DEPRESS EITHER BUTTON		PLAY	L→REC	13.
Playback from channel R while using channel L as microphone amplifier.	DEPRESS EITHER BUTTON		PLAY	R→REC	13.

Useful data

Inputs

		Impedance	Sensitivity	Max. voltage (400 Hz)
MIC		1)	140 µV	23 mV
RADIO	230 V - 240 V/50 Hz	50 k ohms	10 mV	1.2 V
	115 V/60 Hz	33 k ohms	30 mV	5 V
LINE	230 V - 240 V/50 Hz	200 k ohms	100 mV	5 V
	115 V/60 Hz	100 k ohms	100 mV	15 V

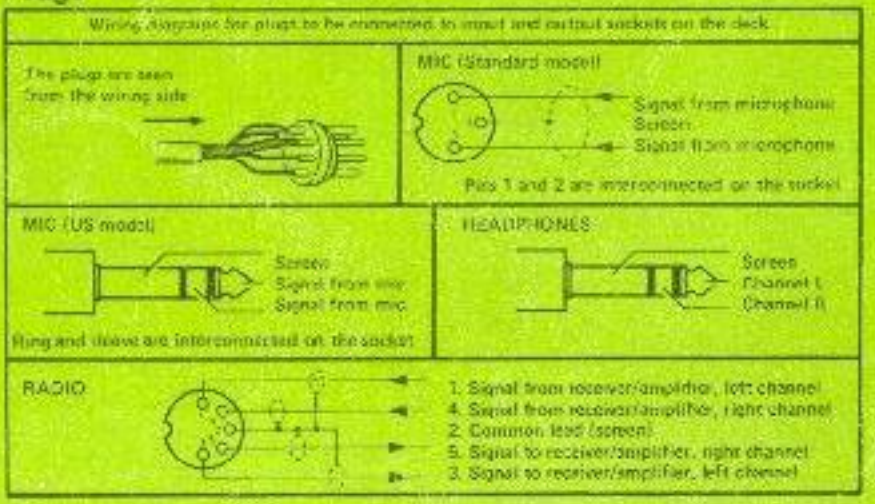
1) Balanced input for dynamic microphone with an impedance of 200 - 700 ohms.

Outputs

	Min. load impedance	Output voltage/power
RADIO	5 k ohms	1 V
LINE	200 ohms	1 V
HEADPHONES	8 ohms	3 mW

Plugs

Wiring diagram for plugs to be connected to input and output sockets on the deck.



TANDBERGS RADIOFABRIKK A/S
Postboks 9, Korsvoll, Oslo 8
Norway

Printed in Norway by Sem & Stenersen A/S
1968 - 2 - 21 Part No. 219606